

Introduction to the Chicago Climate Exchange[®] and its Focus on CMM

Coal Mine Methane Recovery & Use Workshop 9/27/06



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What is Chicago Climate Exchange?

Chicago Climate Exchange (CCX[®]) is North America's only voluntary, legally binding greenhouse gas reduction and trading program for emission sources and offset projects.



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Why Carbon Emissions Trading?

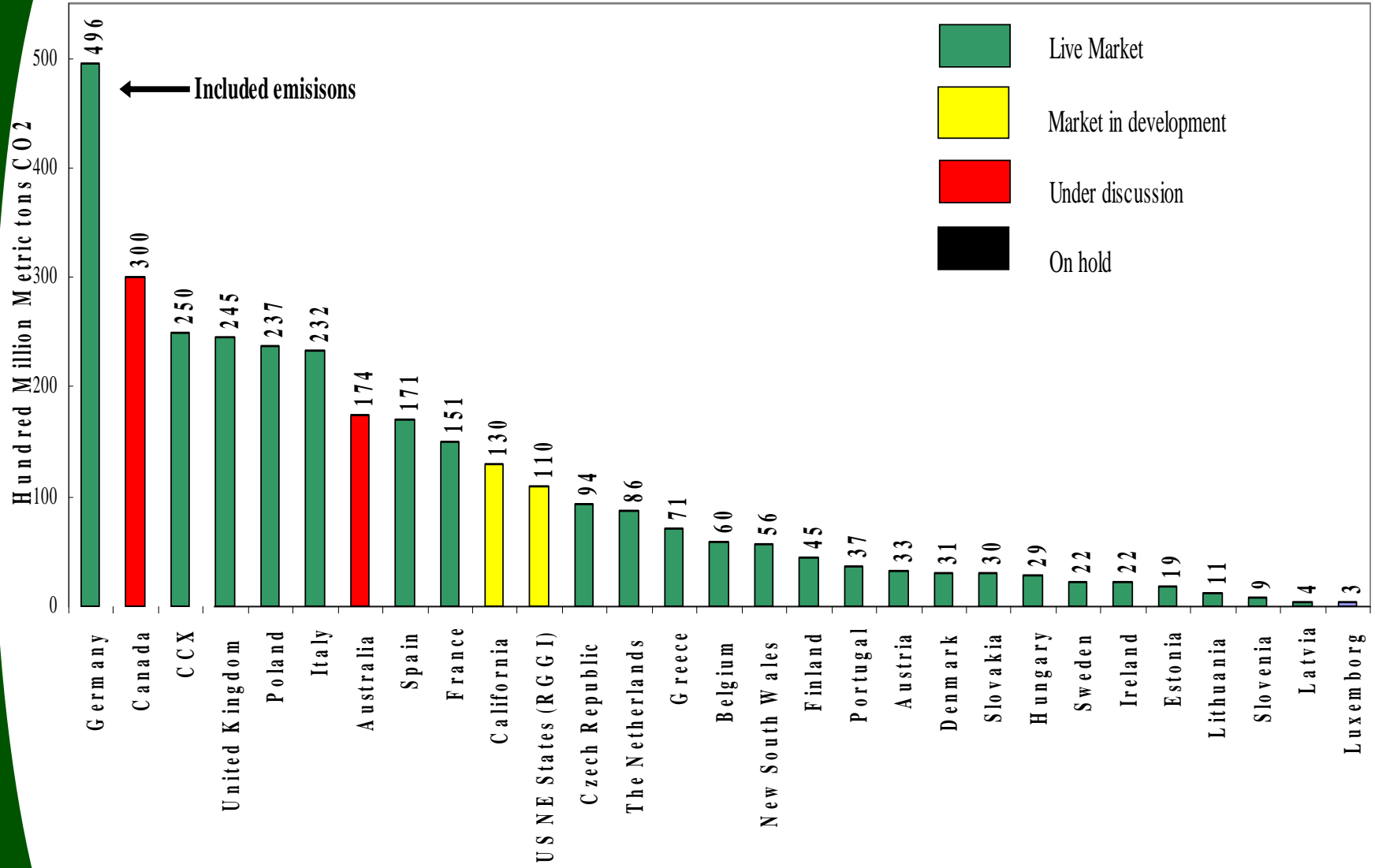
- Proven, least-cost, and sustainable tool for managing emissions
 - Environmental protection with minimum economic harm
 - Flexibility, market efficiencies
 - Multiple successes: US SO₂, lead phase-out (gasoline), NO_x, ETS
- Enhances and rewards sound management practices
- Carbon price signal: reward innovators, encourage creative solutions
- Reveals true cost paid by society



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Size of Live, Emerging, Possible GHG Markets



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The Growing CCX Family

Chicago Climate Exchange (CCX)

- Launched 2003 with 14 members, now 200+ members (US, CA, MX, BR)

European Climate Exchange (ECX)

- FSA-regulated futures market for European CO₂ Allowances
- Launched April, 2005 – accounts for 80-90% of total exchange traded volume in the EU ETS

Chicago Climate Futures Exchange (CCFE)

- CFTC-regulated futures exchange for U.S. SO₂ allowances
- Launched in December 2004, world's first environmental derivatives exchange

Montreal Climate Exchange (MCeX)

- Planned joint venture with the Montreal Bourse
- To host Canadian GHG trading, other environmental markets

New York Climate Exchange™ and Northeast Climate Exchange™

- Developing instruments for northeast Regional Greenhouse Gas Initiative (RGGI)

Indian Climate Exchange

- Partnership with the Multi-Commodity Exchange of India
- In development



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Why do Companies Become CCX Members?

Strategic drivers:

- Reputation advantages
- Create shareholder value
- Corporate risk management

Practical drivers:

Addressing environmental impact can improve business efficiencies and create competitive advantage.

- Improve focus on energy efficiency, identify free savings
- Obtain practical expertise through “hands-on” participation
- Trading profits, possible early action crediting



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Chicago Climate Exchange Members

Aerospace and Equipment

Rolls-Royce

Automotive

Ford Motor Company

Beverage Manufacturing

New Belgium Brewing Company

Chemicals

Dow Corning
Dupont

Electric Power Generation

American Electric Power
Central Vermont Public Service
Duquesne Light Company
Green Mountain Power
Manitoba Hydro
TECO Energy, Inc.

Electronics

Motorola, Inc.
Square D/Schneider Electric N.A

Environmental Services

Waste Management, Inc.

Food Processing

Premium Standard Farms

Forest Products Companies

Abitibi-Consolidated
Aracruz Celulose, S.A.
Cenibra Nipo Brasilliera, S.A.
International Paper
Klabin, S.A.
MeadWestvaco Corp.
Stora Enso North America
Temple-Inland, Inc.

Information Technology

IBM

Manufacturing

Bayer Corporation
Interface, Inc.
Ozinga Bros., Inc.

State & Local Governments

The State of New Mexico*
King County, WA*
City of Aspen
City of Berkeley
City of Boulder
City of Chicago
City of Oakland
City of Portland*

Pharmaceuticals

Baxter International, Inc.

Universities

The University of Iowa
The University of Minnesota
The University of Oklahoma
Tufts University

Recreation

Aspen Skiing Company

Semiconductors

Freescale Semiconductor
STMicroelectronics

Steel

Roanoke Electric Steel Corp.

Transportation

Amtrak
San Joaquin Regional Rail
Commission

*in process



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Associate Members

Architecture/Planning

Mithun, Inc.

Brokerage Services

Amerex Energy

Consulting

Domani, LLC

Global Change Associates

Natural Capitalism, Inc.

RenewSource Development,
L.P.

Rocky Mountain Institute

Documentary Production

Cloverland, Inc.

Energy and Management Services

Orion Energy Systems Ltd

Sieben Energy Associates

Thermal Energy International

Engineering

Rumsey Engineers, Inc.

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Financial Services

Access Industries, Inc.

MB Investments, LLC

Financing Agencies

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Green Power Marketers

Green Mountain Energy Company

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Intercontinental Exchange

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Sullivan & Cromwell, LLP

Non-Governmental Organizations

American Coal Ash Association

American Council on Renewable Energy

Delta Institute

Houston Advanced Research Center

Midwest Energy Efficiency Alliance

World Resources Institute

Private Colleges

Presidio School of Management

Risk Management

The Professional Risk
Managers' International
Association

Religious Organizations

Jesuit Community of Santa
Clara University

Renewable Energy

Airtricity

Intergy

Reknewco, Ltd.

Retiring/Offsets

Carbonfund.org

Terrapass, Inc.

Social Investment

KLD Research & Analytics

Pax World

Technology

Millennium Cell

Polar Refrigerant Technology

Trade Associations

Confederation of British Industry



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Participant Members

Offset Aggregators

C-Green Aggregator, LLC
Delta Institute
Environmental Carbon Credit Pool,
LLC
Environmental Credit Corp.
First Capital Risk Management, LLC
Iowa Farm Bureau
National Carbon Offset Coalition
North Dakota's Farmers Union

Offset Providers

Beijing Shenwu Thermal energy Trading
Co., Ltd.
Intrepid Technologies, Inc.
Lugar Stock Farm
Precious Woods Holdings
Sustainable Forestry Management, Ltd.

Liquidity Providers

AGS Specialists, LLC
Amerex Energy
Breakwater Trading, LLC
Calyon Financial, Inc.
Cargill Power Markets, LLC
Eagle Market Makers, LLC
Evolution Markets, LLC
EXO Investments
FCT Europe, Ltd.
First New York Securities, LLC.
Friedberg Mercantile Group

Galtere International Master
Fund, LP
GFI Securities, LLC
Goldenberg, Hehmeyer & Co.
Grand Slam Trading, Inc.
Grey K Environmental Fund, LP
Haley Capital Management
ICAP Energy, LLC
Kottke Associates, LLC
The League Corp.
Marquette Partners, LP
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Peregrine Financial Group
Rand Financial Services, Inc.
Serrino Trading Co.
Shatkin Arbor, Inc.
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SwissRe Financial Products
TEP Trading 2 Ltd.
TradeLink, LLC
Tradition Financial Services
TransMarket Group, LLC



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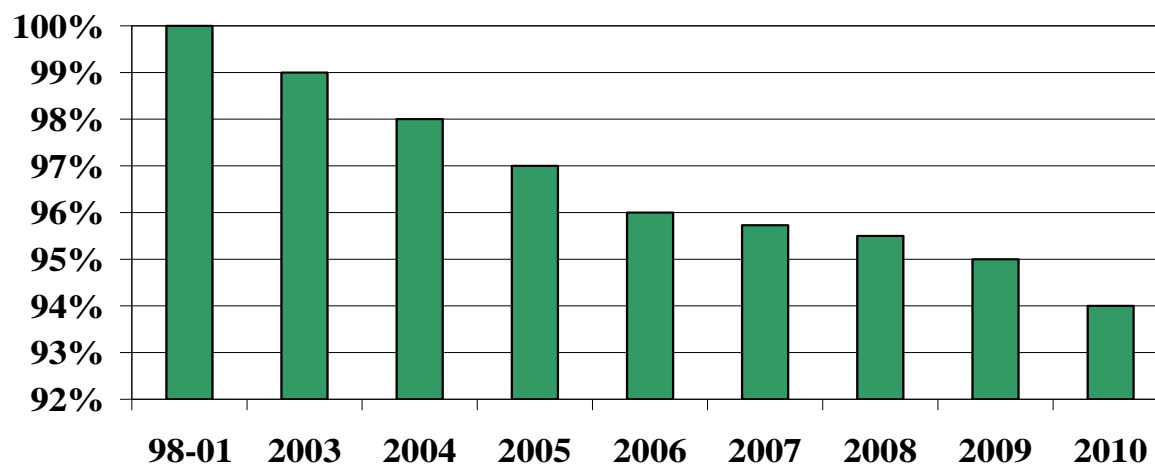
CCX Market Architecture (2003 -2010)

Phase I: Members made legally binding commitments to reduce or trade 1% per year from 2003-2006, for a total of 4% below baseline.

Phase II: Members make a legally binding commitments to reduce to 6% below baseline by 2010.

Baseline = Avg. emissions from 1998-2001, or emissions in 2000.

CCX Emission Reduction Schedule



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Basic Elements of Participation in CCX

- **Prescribed emission quantification methods:**
 - Baseline
 - Annual
 - Independent verification by authorized entities
- **Emission audits conducted by NASD:**
 - World's leading private-sector provider of regulatory services
 - Organized under provisions of Securities Exchange Act of 1934
 - Audit reports approved by CCX's Environmental Compliance Committee
- **Annual True-up**
- **Pre-defined offset projects**



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CCX Offsets Program

- Verified Offset projects sequester or eliminate GHGs and earn Carbon Financial Instruments that can be sold to other CCX members.
- Eligible Project types include:
 - Landfill methane destruction
 - Agricultural (livestock) methane destruction
 - No-till agriculture
 - Forestry
 - Renewable Energy
 - Coal Mine Methane?



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Potential CMM Market Segments

1. Coalmine methane from active underground mining operations
2. Coalmine methane from abandoned underground mines
3. Coalmine methane from strip mining

The most active segment is coalmine methane from active underground operations: pre-mine degasification and collection, gob gas collection



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Benefits of Methane Collection in Underground Operations

- Increases mine safety and productivity
- Generates revenues via gas sales
- Improves operations savings by reducing ventilation costs
 - Stretch ventilation further or
 - Reduces fan size
- Generates positive environmental impact via reduced VAM emissions
- Generate Carbon Credits??



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Active Underground Mines: Opportunities for CMM Capture

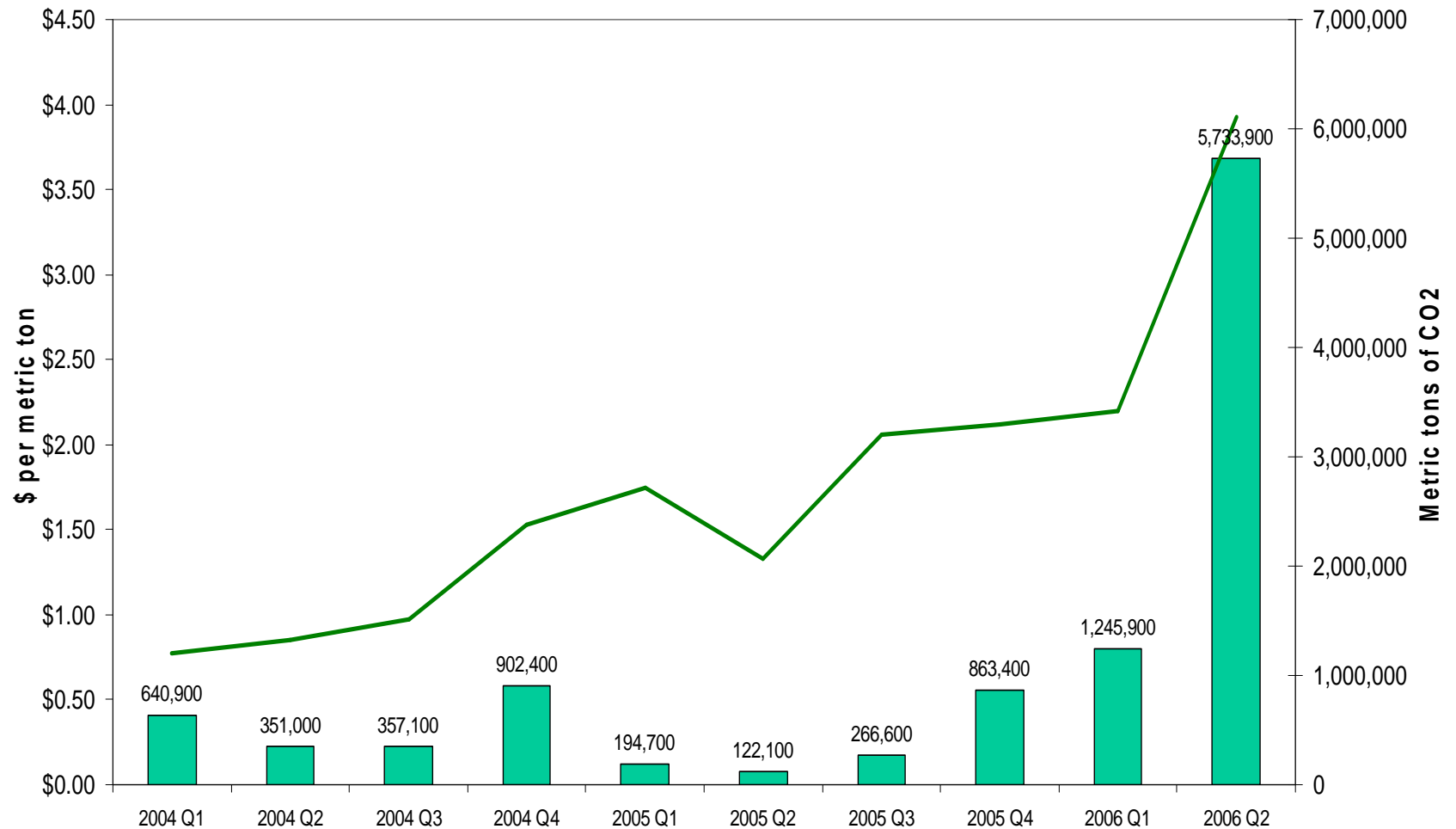
- Vertical frac Wells
- Vertical-to-horizontal frac wells
- In-mine and horizontal CH₄ drainage
- Active, sealed gob well drainage
- *VAM capture??*



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CCX Price* and Volume History 2003 - 2006



* Prices shown are last price of the quarter



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Can Price Drive Capture?

1,000,000 cubic feet of CH₄ = 19.3 metric tons of CH₄

19.3 metric tons of CH₄ X 18.25* = 352.2 tons of CO_{2e}

Price Range for CCX CMM CO_{2e} credits:

352 X \$3.00/mt = \$1056 / mmcf of CH₄

352 X \$4.00/mt = \$1408 / mmcf of CH₄

352 X \$5.00/mt = \$1760 / mmcf of CH₄

At \$3 - \$5/ ton how do carbon credits change the economics of CMM capture?

*Discounted global warming potential of CH₄



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CMM Market Evolution

1. Verify market interest
2. Identify processes and technologies for CMM collection and accounting
3. Develop protocol for project eligibility
4. Establish project verification criteria
5. Engage potential participants

Possible Eligibility Criteria for CCX CMM Underground Mining Operations*

Coalmine Methane vs. Coalbed Methane: Methane generated as a result of the mining process.

CH4 tons eligible for CCX registration: All methane from any well drilled prior to 1/1/03 and mined-through after 1/1/03 can be registered on the Exchange.

CH4 tons eligible for Trade on CCX: Methane collected from wells drilled after 1/1/99 and mined-through after 1/1/03 can be registered and traded on the Exchange, up to the sales limits set for each year.

Area of Influence: 150 meters above and 50 meters below the mined-out area, subject to exception if CMM operators can prove an expanded Area of Influence to a third party verifier.

*First Draft- For Discussion Purposes Only



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Views on CCX

“What would be wrong, at least on a theoretical basis, with taking what you have come up with by way of requirements for your (CCX) members and essentially mandating that everybody in the country comply with those?”

Senator Jeff Bingaman (D-NM), Chairman Senate Energy & Natural Resources Committee, April 4, 2006

“the Chicago Climate Exchange is providing an innovative means of involving American businesses and citizens in the effort to protect the environment. Our nation’s leading companies are buying and trading units of carbon as a way to reduce their impact on climate change. I am hopeful that the economic opportunities provided by the Exchange will enhance the incentives farmers already have to participate in the sequestration of carbon.”

Senator Richard Lugar (R-IN), Chairman of Senate Foreign Relations Committee, May 18, 2006

“The CCX is leading the way toward a future in which reducing greenhouse gases could bring not only environmental rewards, but financial ones too.”

Al Gore, from An Inconvenient Truth, 2006



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